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§ 229.73 Wheel sets.

(a) The variation in the circumference of wheels on the same axle may not exceed ¼ inch (two tape sizes) when applied or turned.

(b) The maximum variation in the diameter between any two wheel sets in a three-powered-axle truck may not exceed ¾ inch, except that when shims are used at the journal box springs to compensate for wheel diameter variation, the maximum variation may not exceed 1¼ inch. The maximum variation in the diameter between any two wheel sets on different trucks on a locomotive that has three-powered-axle trucks may not exceed 1¼ inch. The diameter of a wheel set is the average diameter of the two wheels on an axle.

(c) On standard gauge locomotives, the distance between the inside gauge of the flanges on non-wide flange wheels may not be less than 53 inches or more than 53½ inches. The distance between the inside gauge of the flanges on wide flange wheels may not be less than 53 inches or more than 53¼ inches.

(d) The distance back to back of flanges of wheels mounted on the same axle shall not vary more than ¼ inch.

§ 229.75 Wheels and tire defects.

Wheels and tires may not have any of the following conditions:

(a) A single flat spot that is 2½ inches or more in length, or two adjoining spots that are each two or more inches in length.

(b) A gouge or chip in the flange that is more than 1½ inches in length and ½ inch in width.

(c) A broken rim, if the tread, measured from the flange at a point five-eighths inch above the tread, is less than 3¾ inches in width.

(d) A shelled-out spot 2½ inches or more in length, or two adjoining spots that are each two or more inches in length.

(e) A seam running lengthwise that is within 3¾ inches of the flange.

(f) A flange worn to a ⅞ inch thickness or less, gauged at a point ⅜ inch above the tread.

(g) A tread worn hollow 5⁄16 inch or more on a locomotive in road service or ⅜ inch or more on a locomotive in switching service.

(h) A flange height of 1½ inches or more measured from tread to the top of the flange.

(i) Tires less than 1½ inches thick.

(j) Rims less than 1 inch thick on a locomotive in road service or less than ¾ inch on a locomotive in yard service.

(k) A crack or break in the flange, tread, rim, plate, or hub.

(l) A loose wheel or tire.

(m) Fusion welding may not be used on tires or steel wheels of locomotives, except for the repair of flat spots and worn flanges on locomotives used exclusively in yard service. A wheel that has been welded is a welded wheel for the life of the wheel.

ELECTRICAL SYSTEM

§ 229.77 Current collectors.

(a) Pantographs shall be so arranged that they can be operated from the engineer's normal position in the cab. Pantographs that automatically rise when released shall have an automatic locking device to secure them in the down position.

(b) Each pantograph operating on an overhead trolley wire shall have a device for locking and grounding it in the lowest position, that can be applied and released only from a position where the operator has a clear view of the pantograph and roof without mounting the roof.

§ 229.79 Third rail shoes.

When locomotives are equipped with both third rail and overhead collectors, third-rail shoes shall be deenergized while in yards and at stations when current collection is exclusively from the overhead conductor.

§ 229.81 Emergency pole; shoe insulation.

(a) Each locomotive equipped with a pantograph operating on an overhead trolley wire shall have an emergency pole suitable for operating the pantograph. Unless the entire pole can be safely handled, the part of the pole which can be safely handled shall be marked to so indicate. This pole shall be protected from moisture when not in use.

(b) Each locomotive equipped with third-rail shoes shall have a device for

insulating the current collecting apparatus from the third rail.

§ 229.83 Insulation or grounding of metal parts.

All unguarded noncurrent-carrying metal parts subject to becoming charged shall be grounded or thoroughly insulated.

§ 229.85 High voltage markings: doors, cover plates, or barriers.

All doors, cover plates, or barriers providing direct access to high voltage equipment shall be marked ''Danger-High Voltage'' or with the word ''Danger'' and the normal voltage carried by the parts so protected.

[77 FR 21346, Apr. 9, 2012]

§ 229.87 Hand-operated switches.

All hand-operated switches carrying currents with a potential of more than 150 volts that may be operated while under load shall be covered and shall be operative from the outside of the cover. Means shall be provided to show whether the switches are open or closed. Switches that should not be operated while under load shall be legibly marked with the words ''must not be operated under load'' and the voltage carried.

§ 229.89 Jumpers; cable connections.

(a) Jumpers and cable connections between locomotives shall be so located and guarded to provide sufficient vertical clearance. They may not hang with one end free.

(b) Cable and jumper connections between locomotive may not have any of the following conditions:

(1) Broken or badly chafed insulation.

(2) Broken plugs, receptacles or terminals.

(3) Broken or protruding strands of wire.

§ 229.91 Motors and generators.

A motor or a generator may not have any of the following conditions:

(a) Be shorted or grounded.

(b) Throw solder excessively.

(c) Show evidence of coming apart.

(d) Have an overheated support bearing.

(e) Have an excessive accumulation of oil.

INTERNAL COMBUSTION EQUIPMENT

§ 229.93 Safety cut-off device.

The fuel line shall have a safety cut-off device that—

(a) Is located adjacent to the fuel supply tank or in another safe location;

(b) Closes automatically when tripped and can be reset without hazard; and

(c) Can be hand operated from clearly marked locations, one inside the cab and one on each exterior side of the locomotive.

§ 229.95 Venting.

Fuel tank vent pipes may not discharge on the roof nor on or between the rails.

§ 229.97 Grounding fuel tanks.

Fuel tanks and related piping shall be electrically grounded.

§ 229.99 Safety hangers.

Drive shafts shall have safety hangers.

§ 229.101 Engines.

(a) The temperature and pressure alarms, controls and related switches of internal combustion engines shall function properly.

(b) Whenever an engine has been shut down due to mechanical or other problems, a distinctive warning notice giving reason for the shut-down shall be conspicuously attached near the engine starting control until repairs have been made.

(c) Wheel slip/slide protection shall be provided on a locomotive with an engine displaying a warning notice whenever required by § 229.115(b).

STEAM GENERATORS

§ 229.103 Safe working pressure; factor of safety.

The safe working pressure for each steam generator shall be fixed by the chief mechanical officer of the carrier. The minimum factor of safety shall be four. The fixed safe working pressure shall be indicated on FRA Form F 6180–49A.